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Municipalities and Energy- An Introduction

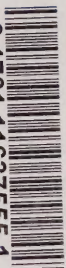


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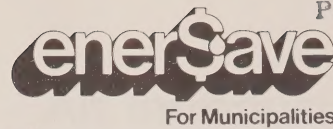


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Municipalities and Energy- An Introduction

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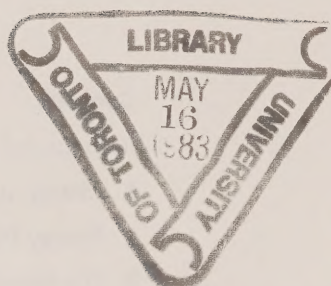
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For further information, contact your provincial department of energy or the Department of Energy, Mines and Resources, Ottawa.



Municipalities and Energy - An Introduction

Introduction

Rising energy prices are placing increasing pressure on municipal budgets, and these costs are escalating at a time of mounting public pressure to contain government expenditures. Yet price increases can be expected to continue in the foreseeable future - for energy, and for the many goods and services affected by increased energy prices.

Local government officials face a difficult set of options: raise taxes, reduce operating costs, or divert funds from other municipal services. Yet most municipalities seek to provide their communities with a continuing high standard in the level of services and in quality of life. What is more, a high level of services is expected.

Energy use, ironically, offers municipalities one of the least controversial and most socially desirable ways to reduce over-all costs by tightened control of energy consumption and improved energy use planning. Improving energy efficiency through conservation measures produces direct economic benefits. It also results in far greater understanding of the pattern of municipal energy use.

A Guide to Municipal Energy Savings indicates the wide range of conservation possibilities in municipal operations.

Each section of this publication discusses a different aspect of an internal energy management program, with particular attention to municipally-owned and operated facilities and equipment.

Before dealing with specific municipal functions, however, the text sets out, in

Section 2, the key points to consider when an energy management program is being planned. Sections 4 and 5 then examine two important tools available to the municipality developing its program - the municipal energy audit, to identify baseline energy consumption figures, and financial analysis techniques to determine the cost effectiveness of conservation projects.

Section 3 looks at the connection between land use and community energy consumption. Energy-conscious planning is not a source of direct savings to the municipality. It can influence community energy use, however, and local governments are becoming increasingly interested in this field.

Finally, the Appendix describes what specific Canadian municipalities have done to conserve energy and to encourage energy conservation in their communities. These case studies are not offered as models, and should not be used as such. They simply illustrate the savings that are possible and the kinds of measures that have worked in different communities throughout the country.

Above all, this book is not a manual, and it offers no hard and fast rules on how to proceed. Each municipality is unique, and must develop programs designed specifically to take account of local circumstances. In any case, too much excellent and detailed information is available to be summarized usefully - sources listed at the end of each chapter will provide specific information on particular topics, and can be obtained when they are needed.

Additional references and promotional aids are described at the close of this section.

1- Energy and Municipal Operations

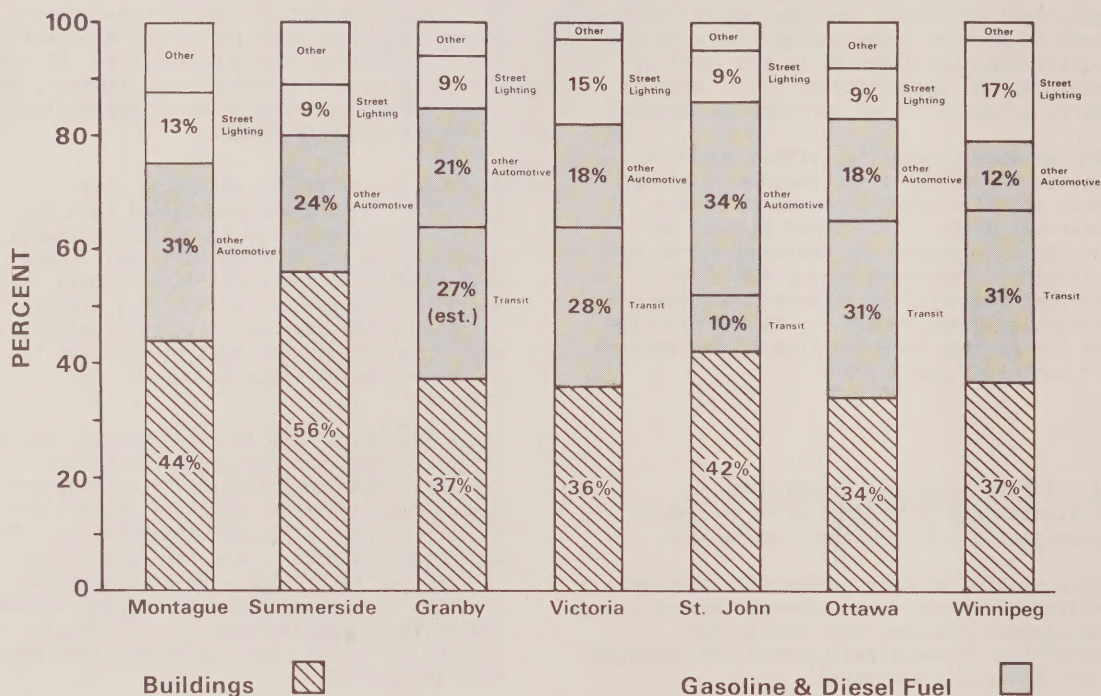
How significant a factor is energy in municipal operations? The answer varies with each community. A detailed study of energy use in seven Canadian communities indicates that total energy costs account for anywhere from 2.5 to 20% of total municipal budgets.* Populations in these

survey communities ranged from 1,823 to 560,894, and it is clear from the data that small municipalities spend a much larger proportion of their total budget on energy than do larger municipalities.**

For both large and small communities, however, a reduction in energy consumption offers considerable savings - in small communities through sizable reduction in the proportion of available funds required for energy, and in larger communities through the large dollar savings achieved by even a small percentage reduction in energy use.

TABLE 1

ENERGY USED IN BUILDINGS AND AUTOMOTIVE FUELS AS RELATED TO TOTAL ENERGY



SOURCE: Municipal Energy Audit: A Practical Guide to the Identification of Energy Expenditures, Energy Mines and Resources, 1980

* "Municipal Energy Audit: A Practical Guide to the Identification of Energy Expenditures", Building Series No. 3, Conservation and Renewable Energy Branch, Department of Energy, Mines and Resources, page 34.

** Perhaps because the level of services is lower. Figures range from 20.7% for Montague, P.E.I. (population 1,823) to 3.2% for Ottawa (population 304,500).

In general, municipal buildings are the single highest municipal energy consumer, accounting for approximately one half of total energy use. Automotive fuels and street lighting, in that order, are the next largest consumers. In those communities where they exist, public transit systems come second only to buildings in their level of energy consumption.

There are few consistent patterns in a breakdown of energy use by municipal function.

This reflects very real variations in the situation facing different municipalities. Climate, location, size and density, the economic base, the level of services, the number of municipal buildings, topographical features, development characteristics - all these factors influence the kind and quantity of energy consumed by the municipality.

Sources of energy, and thus the factors influencing supply, also vary considerably,

and communities in the import-dependent provinces of Atlantic Canada must respond to a different set of pressures than those facing Western municipalities.

A comparison of the types of fuel used by each municipality reveals a predictable reliance on petroleum products, for transportation-related activity and for heating.

Such breakdowns are useful in analyzing where costs can be reduced through fuel substitution (e.g. from gasoline to diesel or oil to gas). An important aspect of long-term energy management, fuel substitution measures, must be weighed carefully. They may involve major changes to existing systems and/or replacement of equipment, and can be both costly and complex. The long-term benefits in dollar savings and in increased reliability of supply, however, can make such measures extremely cost effective.

TABLE 2
ENERGY USE BY MUNICIPAL FUNCTION

	population under 50,000			population 50,000 - 200,000		population over 200,000	
	Montague	Summerside	Granby	Victoria	Saint John	Ottawa	Winnipeg
Function	Percent of Total Use						
Street lighting	13	9	9	15	9	9	17
Water	-	7	16	1	7	0	4
Sewage	28	8	1	2	2	7	8
Sanitation	11	8	5	5	3	2	2
Snow and ice	10	5	5	-	8	7	2
Road maintenance	-	9	6	1	15	3	2
Police	9	10	2	4	10	5	6
Transit	-	-	27	31	13	35	33
Admin. & misc.	26	10	8	21	23	11	19
Fire	1	6	1	2	2	2	1
Parks & recreation	2	28	20	18	8	10	6

Source: Municipal Energy Audit: A Practical Guide to the Identification of Energy Expenditures, op. cit.

TABLE 3
FORM OF ENERGY USED, BY MUNICIPALITY

	Electricity	Fuel Oil	Gas & Diesel (transit)	Gas & Diesel (other)	Natural Gas	Other
Municipality	Percent					
Montague	43.8	23.8	-	32.4	-	-
Summerside	26.1	47.0	-	26.9	-	-
Granby	37.1	17.2	28.7	17.0	-	-
Victoria	27.9	25.7	28.6	17.8	-	-
Saint John	25.0	29.3	11.3	33.2	-	1.2
Ottawa	24.1	17.7	31.6	20.0	6.6	-
Winnipeg	33.7	0.6	31.3	11.7	19.6	3.1

Source: Municipal Energy Audit: A Practical Guide to the Identification of Energy Expenditures, op. cit.

2- Energy Price Trends

Since energy costs are a significant factor in municipal operations it is important to look briefly at recent price trends in Canada. Oil, still our major energy source, is becoming increasingly expensive. Statistics provide graphic evidence of the

rate at which crude oil prices have risen since 1973.

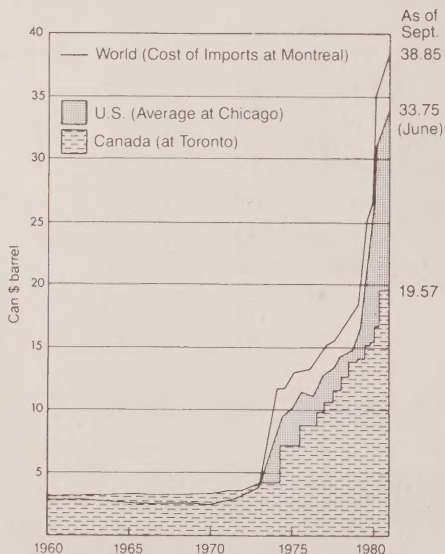
Although Canadian prices are still well below United States and world levels, Canadian price increases have already had a strong impact on individuals, on businesses and on government operations.

The process of substituting alternative energy sources for oil promises to be slow and costly, and in some cases will bring a new set of socially and environmentally contentious issues to be resolved. Developing our resources to reach a goal of energy independence will not alter high prices.

There are several reasons for this:

- Current reserves of low cost Canadian oil, that is oil which is relatively inexpensive to extract, will be largely depleted within ten years.
- Potential new supplies of oil are remote or, like the oil sands and off-shore sources, difficult to extract. They therefore offer an expensive alternative to present sources.
- Possible oil substitutes will also be expensive, at least in the near future, because of the high cost of construction (as with hydro or nuclear plants), because of environmental considerations (as in a return to coal), and/or because

TABLE 4
CRUDE OIL PRICE: WORLD, UNITED STATES, CANADA



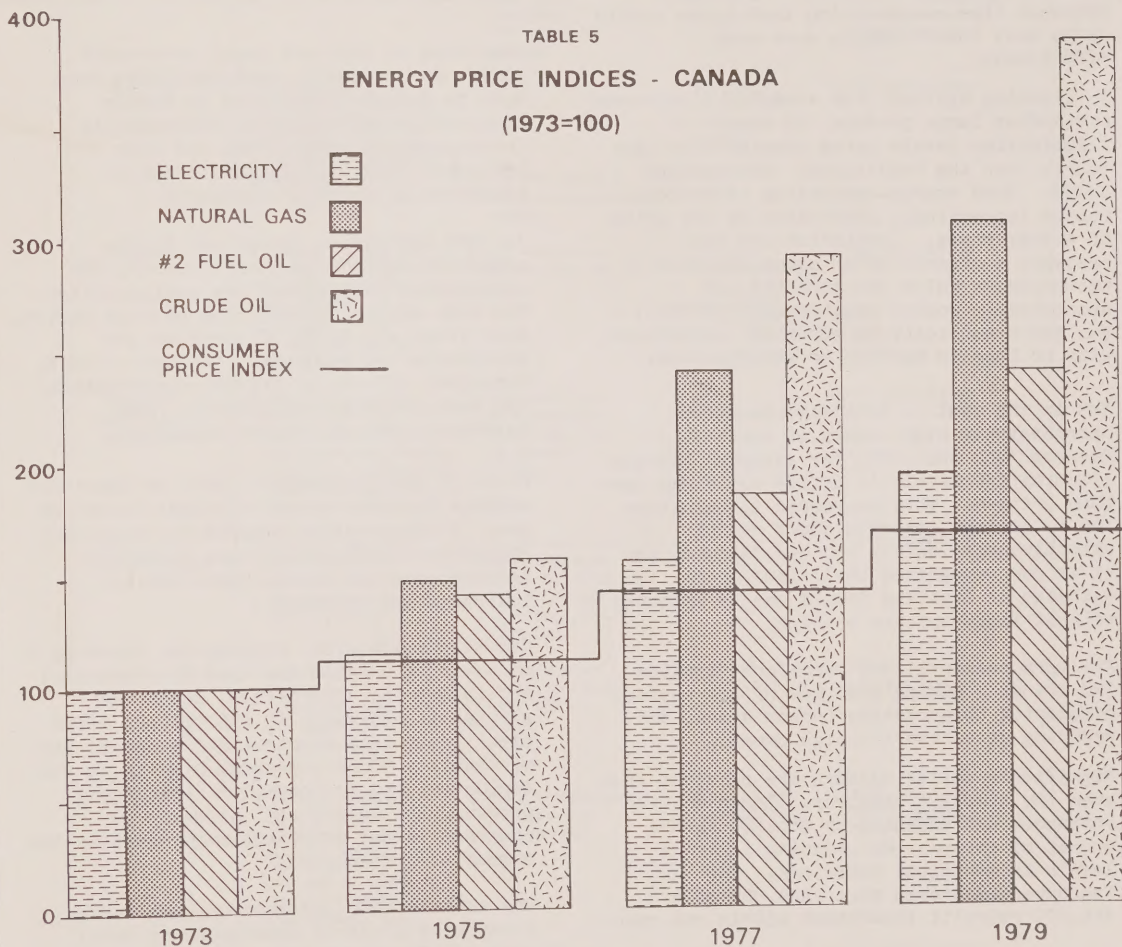
SOURCE: Background to a New Energy Strategy, EMR., November 1979, (updated April, 1980)

of the high cost of new infrastructure needed to transfer and utilize the fuel (expanding the availability of natural gas).

- Alternative energy sources - sun and wind, for example - are generally still in the early stages of development, experimentally and commercially. Although these resources will be increasingly important, most estimates predict that in Canada these sources will supply less than 10% of energy requirements by the year 2000.

Increases in the price indices for Canada's major energy sources bring the point home: between 1973 and 1980 prices have at least doubled or tripled for each of Canada's three major fuel sources, electricity, natural gas and oil. In comparison the Consumer Price Index has risen by approximately 80% over the same period. It is very likely that the rate of price increase for each of these major energy sources will continue to be higher than the overall inflation rate in the foreseeable future.

TABLE 5
ENERGY PRICE INDICES - CANADA
(1973=100)



SOURCE: The Canadian Energy Situation: Trends and Options, EMR, March 1980.

3- The Need for Conservation

Certain conclusions are inescapable. First, Canadians can no longer afford to waste energy the way we once did. Second, all Canadian energy users, including municipalities, will continue to face high and rising energy costs.

Conservation techniques can make a real difference to the amount of energy consumed in municipal operations. Basically, energy is needed to satisfy demands for various goods and services. There is growing evidence that conservation techniques enable us to meet these demands more cost effectively.

In lighting systems, for example, fluorescent and sodium lamps produce the same illumination levels using considerably less energy than the traditional incandescent bulbs. Such energy-conserving technologies become increasingly profitable as the price of energy rises. Insulation and heat recovery equipment offer other examples of technologies which can directly and economically reduce requirements for oil, gas and electricity in municipal operations, with no loss in service or satisfaction.

Yet in the past we have also demanded unnecessarily high levels of service. Between 1950 and 1975, for example, average illumination levels in office buildings more than tripled. This increased illumination led to serious concerns about visual effectiveness, safety and eye fatigue, and it is now recognized that significant cutbacks in lighting levels can be achieved without inconvenience or risk.

The term conservation, therefore, implies two things - making good use of the rapidly developing conservation technologies, and reducing unnecessarily high demand.

Significant dollar savings are possible from even the simplest measures. Edmonton, for instance, cut expenses by \$66,500 in the course of one year by reducing lighting levels in municipal buildings. And Vancouver recovered more than 85% of a \$46,000 retrofit investment within one year.

These savings can in fact be seen as revenue or a new resource for the municipality. "Conserved" dollars can be invested in new conservation measures, resulting in further energy savings.

From another perspective, energy raises new demands for municipal leadership in the community. As each municipality faces rising costs, so does each individual, and people are becoming increasingly intolerant of energy waste. They expect their tax dollars to be used effectively, and often look to local government for assistance in their own efforts to reduce energy consumption. Gradually good energy management is becoming a measure of good government.

4- The Role of the Municipality

What kind of role can local government play? As discussed, municipalities have much to gain by tightening up energy consumption and achieving economies in internal operations. They can also influence public attitudes to energy conservation in their community.

In turn individual energy use in the community influences, collectively, the consumption patterns of the municipality - how much energy is used, how much is wasted, what level and kinds of services are acceptable and required. Because of this, municipal efforts to promote conservation can have far-reaching effects, both internally and within the community.

First, a local government sets an important example through its own attitude to energy use. A conservation program for municipal operations demonstrates that community leaders consider energy conservation important and necessary.

Secondly a municipal program can serve as a model to be adopted and used by commercial and industrial enterprises, while the savings it achieves, if publicized, offer clear proof that conservation measures are worthwhile. Such a program signals to the community, and to taxpayers, that their government places a real priority on responsible and efficient management of the community's resources.

The municipality can also support energy conserving projects undertaken by local groups. There are examples of municipal governments and local organizations working together on effective recycling programs. Some municipalities have provided support for projects demonstrating energy conserving techniques and alternative technologies.

TABLE 6: Energy Savings in Canadian Municipalities

Municipality	Conservation	Energy Savings	\$ Savings	Financing
Oromocto*	o no cost and low cost measures	o 116,000 kwh (1978) o an additional 80,071 kwh (1979) o 31% reduction in fuel consumption	o no information	o expenditures not specified o most funds drawn from maintenance budget o major items (ie. ceiling fans) provided for in town budget
Metropolitan* Toronto	o Expressway relamping with low pressure sodium	o 332,000 kwh (1978) o 590,640 kwh (1979) (42% power reduction over original system)	o \$27,000/yr for every 1000 fixtures (estimate)	o Roads & Traffic Department capital funds o \$700,000 total for 31 kilometres of expressway (approximate)
Edmonton	o relamping and delamping (1978) o relamping, more efficient lighting in new areas (1979) o switch to diesel	o 50% fuel saving over gas-powered trucks	o \$66,500 (1978) o \$250,000 (1979)	o no information
Vancouver	o no-cost modifications to mechanical systems (1977) o conversion of Queen Elizabeth Theatre from oil to gas (1978)	o 19% reduction in heating fuel	o \$37,000 (1978 prices) o \$10,000/yr (1978 prices)	o no information
Regional Municipality of Durham	o no-cost measures (i.e. reducing temperatures and illumination levels; removing unnecessary lighting; improving furnace efficiency)	o 10% reduction in electricity, 6% in gas, 8% in diesel (1978)	o no information	o no information
City of Mississauga*	o no-cost measures in municipal operations o no-cost measures in City Hall	o 11.4% reduction in energy use, 10.5% in water use o 38.3% savings in energy, 49.1% in water	o \$91,913 (1979)	o no information
London	o reduced heat and illumination levels, improved insulation and improved operating techniques in London City Hall	o 27% reduction in electricity use, 18% in steam	o \$95,000 (1977-78)	o \$40,000 from capital budget
Montreal	o install controls in municipal buildings (night and day thermostat for temperature setback at night, indoor/outdoor regulators, etc.) o lower wattage lamps installed in traffic signals	o 10-15% reduction in fuel oil consumption o 1,632,000 kwh per year	o \$80,000 per year (projected)	o \$100,000 from Public Works Department budget o no extra costs

* See Appendix, "Municipal Energy Savings - Some Case Studies"

Others have worked with developers to make housing projects more energy efficient. By organizing events such as Energy Fairs and Conservation Weeks, still other municipalities have directly involved every sector of their community in publicizing energy issues.

Hand in hand with this support of local projects, the municipality can also act as a source of energy-related information by distributing available government publications literature and other

promotional aids.

Finally, municipalities can affect the type of new development taking place within their jurisdiction, and in this way influence future energy use patterns in the Community. Transportation policy, innovative technologies and land use planning measures offer municipal governments important levers for introducing energy efficient operations and services in an increasingly energy-sensitive community.

Appendix A:

Energy in Print

A quick look through bookstore shelves and library stacks will reveal many good sources of information on energy, with energy conservation and energy supply receiving particular attention.

There is also a growing body of information more specifically related to municipal concerns, particularly in terms of planning issues.

The references included in this bibliography have been selected because they are particularly pertinent to Canadians. The list is far from complete, and those who wish to explore energy issues further should refer to the bibliographies mentioned below. Each offers a well-annotated survey of available literature.

Energy Management

Department of Energy, Mines and Resources
Canadian Oil and Gas Supply/Demand Overview
Ottawa: Department of Energy, Mines and Resources, November 1979. 98pp. Free

Detailed assessment of prospects for supply and demand for oil and gas in Canada over the next 10 to 20 years, based on a wide range of pricing scenarios.

Available from the Publications Distribution Centre, Department of Energy, Mines and Resources, 580 Booth Street, Ottawa K1A 0E4.

Gander, James E., and Belaire, Fred W.
Energy Futures for Canadians: Long-Term Energy Assessment Program
Ottawa: Department of Energy, Mines and Resources, 1978. \$5.00

A study providing a long-term assessment of Canada's energy supplies and requirements. Discusses the roles of government and the public during the half century to 2025 in making the transition from an era of cheap and readily available fossil fuels to an age of modified energy demand. Concludes with a lengthy list of recommendations for

adjusting energy use and attitudes, which must be adopted now if long-term goals are to be met.

Available from the Publications Distribution Centre, Department of Energy, Mines and Resources, 580 Booth Street, Ottawa K1A 0E4.

Department of Energy, Mines and Resources
The National Energy Program 1980
Ottawa: Department of Energy, Mines and Resources, 1980. 115 pp. Free

A discussion of the Canadian energy situation within the context of national energy policies and programs.

Available from the Publications Distribution Centre, Department of Energy, Mines and Resources, 580 Booth Street, Ottawa K1A 0E4.

Stobaugh, R. and Yergin, D. (editors)
Energy Future - Report of the Energy Project at the Harvard Business School
New York, N.Y.: Random House, 1979.
paperback \$3.50

One of the most up-to-date examinations of energy supply issues; in particular Chapter 6, Conservation: The Key Energy Resource, is an articulate argument for treating energy conservation as a serious and significant contribution to energy services such as space heating, water heating and refrigeration.

Growth in a Conserving Society: Based on Papers Prepared for the 47th Couchiching Conference of the Canadian Institute on Public Affairs
Toronto, Ont.: Yorkminster Publishing Limited, 1979. softcover: \$6.95

Twenty-seven papers outlining the wisdom of moving from a period of undifferentiated, energy-intensive growth to an age in which growth and resource conservation are reconciled.

Valaskasis, Kimon, John Graham Smith, Peter S. Sindell and Iris Fitzpatrick-Martin
The Conserver Society: A Workable Alternative for the Future
New York, NY: Harper and Row, 1979.
hardcover: \$19.50 softcover: \$6.50

Sets out three scenarios of conservation requiring varying degrees of change in

lifestyles and values, and argues for an aware, conserving lifestyle which, the authors believe, can be accepted by North Americans today.

The Canadian Energy Catalogue
Toronto, Ont.: Ontario Library Association, 1980.

A directory of individuals and organizations, and (in a separate volume) an annotated bibliography covering all aspects of energy, including conventional as well as renewable sources.

Energy and the Municipality

Bureau of Municipal Research
What Can Municipalities Do About Energy?
Toronto: BMR, March 1978. Softcover, 47 pp. \$2.00

Demonstrates that municipalities have an important role to play in promoting sound energy use. Examines four areas for municipal action: land use and transportation planning, building and site design requirements, development of local renewable energy sources, and public education and demonstration programs.

Available from BMR, 2 Toronto Street, Suite 306, Toronto, Ontario M5C 2B6

Lang, Reg. and Lounds, John
Information Resources for Municipal Energy Planning and Management
Faculty of Environmental Studies, York University, Working Paper No. 1, September 1979. Softcover, 125 pp. \$5.00

An annotated bibliography of energy literature focusing on energy conservation; resources; urban form and land use planning; site planning, design and building; municipal management. Also includes a brief discussion of energy projects underway in communities throughout North America.

Available from the Publications Coordinator, Faculty of Environmental Studies, York University, 4700 Keele Street, Downsview, Ontario M3J 2R2.

Department of Energy, Mines and Resources
Municipal Energy Audit: A Practical Guide to the Identification of Energy Expenditures
Ottawa: Department of Energy, Mines and Resources, Building Series No. 3, 1981. Free

Available from the Publications Distribution Centre, Department of Energy, Mines and Resources, 580 Booth Street, Ottawa K1A 0E4

Saxe, Dianne
Perspectives on Access to Solar Energy
Toronto: Ontario Ministry of Energy, 1978. \$2.00

A working paper on legal aspects of the right to light and its potential impact on land use, in the Ontario context but of wider general interest.

Available from Government of Ontario Bookstore, 880 Bay Street, Toronto, Ontario M7A 1N8 (cheque payable to the Treasurer of Ontario).

Chibuk, John
Energy and Urban Form
Ottawa: Ministry of State for Urban Affairs, 1977. 24 pp. Free

Discusses energy in relation to density, urban settlement patterns, land use arrangements and other urban form factors.

Available from the Information Resource Centre, CMHC, Montreal Road, Ottawa K1A 0P7.

Appropriate Technologies and Building Design

Argue, Robert
Renewable Energy Resources: A Guide to the Literature
Ottawa, Ont.: Department of Energy, Mines, and Resources, 1977.

An annotated bibliography listing sources on all aspects of renewable energy, focusing on those considered most applicable to Canadian settings.

Flagler, Gordon
The Canadian Wood Heat Book: A Complete Guide and Catalogue
Ottawa, Ont.: Deneau and Greenberg, 1979. softcover: \$8.95

A guide to wood heating especially prepared for Canadian readers. Discusses the various stove, furnace, and fireplace options available; deals with purchase, installation, and maintenance of

wood-heating systems; and includes sections on getting, preparing, and using wood. Also contains a catalogue of products available in Canada.

Available from Deneau and Greenberg Publishers, Suite 205, 305 Metcalfe Street, Ottawa K2P 1S1

Gough, Bruce D.
Passive Solar Heating in Canada
Ottawa: Department of Energy, Mines and Resources, 1979. Free

A discussion paper suggesting that passive solar heating already contributes approximately one-eighth of Canada's gross residential heating requirements, and that it can be developed so as to become an even more significant renewable resource.

Canada Mortgage and Housing Corporation
The Conservation of Energy in Housing
Ottawa, Ont.: CMHC, 1977. \$3.00

A well organized, thorough handbook detailing ways in which residential buildings can be made more energy-efficient. While site choice and building design are considered, the main focus is on upgrading existing houses and on ways of saving energy in appliance use and in heating systems.

Available from the Information Resource Centre, CMHC, Montreal Road, Ottawa K1A 0P7.

Municipal Energy Conservation-Case Studies

Gibson, Judith
Local Energy Initiatives in Canadian Urban Settlements
Ottawa: Canada Mortgage and Housing Corporation, March 1979. 145 pp. Free

An examination of energy-related projects in communities across Canada, including 50 case studies. These include institutional conservation programs, municipal infrastructure projects, urban planning, building design and construction, public information and educational activities.

Available from the Information Resource Centre, CMHC, Montreal Road, Ottawa K1A 0P7.

Lang, Reg. and Armour, Audrey
Sourcebook: Energy Conservation in Twenty Canadian Cities
Toronto: City, 1980. \$4.00 plus postage & handling

Survey of energy conservation activities in Canada's twenty largest cities, carried out in preparation for the Cities and Energy Conference held in Toronto.

Available from City of Toronto, City Hall, Toronto M5H 2N2.

Lang, Reg. and Armour, Audrey
Casebook on Energy-Conserving Land Use Planning and Control
Ottawa: Department of the Environment, (in preparation for publication late 1981)

To be available from the Lands Directorate, Environment Canada, Ottawa K1A 0E7.

Strategies for Change

Rothman, Jack, Erlich, John, Teresa, Joseph
Promoting Innovation and Change in Organizations and Communities: A Planning Manual
John Wiley & Sons, Inc., New York, 1976.

Available from local bookstores.

Schon, Donald A.
Beyond the Stable State
W.W. Norton & Company Ltd., New York, 1971.

Available from local bookstores, softcover.

Sewell, Derrick W.R., and Foster, Harold D.
Analysis of the United States Experience in Modifying Land Use to Conserve Energy
Ottawa: Department of the Environment, 1980.

An analysis of the American experience in land use planning for energy conservation, with a view to determining its relevance to Canada. The study includes detailed case studies of two communities, Portland, Oregon and Lincoln, Nebraska, with particular attention to the reaction to change within the communities and an identification of interest groups involved.

Available from the Lands Directorate, Environment Management Services, Department of the Environment, Ottawa K1A 0E7. Please specify Catalogue No. EN 73-4/2E.

Appendix B:

Energy on Film

Audio-visual materials are valuable aids in providing information and stimulating discussion. The following list of films, videotapes and slide shows is included as a reference for municipalities planning seminars and workshops for municipal officials or for the wider community.*

The Energy Picture

Energy in Perspective

30 min. col.

Modern Talking Picture Service**

Outlines a major challenge of our times: to find ways to more wisely use the energy sources we know, to harness and develop some prolific new sources, and to do it in a single generation. A well-balanced view that, notwithstanding its source (British Petroleum) does not urge continued reliance on fossil fuels.

rental: free

Energy in Canada: Feast or Famine

30 min. col.

Modern Talking Picture Service

A balanced basic introduction to the energy supply problem facing Canada in the next generation even if fuel demand per capita in an increased population does not grow. Filmed at a National Research Council lecture given to school children, and appropriate as a discussion starter for all groups.

rental: free

* Drawn from Energy: Sound and Light, one in a series of booklets produced as the Community Energy Kit by Avatar Consulting Cooperative, Inc. for the Department of Energy, Mines and Resources.

** Addresses for all sources are listed at the end of this section.

Overview of the Canadian Energy Situation EMR slide show with script

A complete look at Canada's resource picture, the cost of developing energy resources, the need for conservation, and ways to conserve.

rental: free

Energy Consumption

The Club of Rome

57 min. col. NFB 106c 0175 199

Outlines the philosophies, aims, and operations of the controversial group which predicted that a complex set of economic, political, social, technological, and ecological problems could lead to disaster before the year 2000.

The Conserver Society

twin projector 160 slide show
SPEC

A long-term view of North American environmental and social development, leading up to our throw-away society. Introduces the idea of a society which values conservation, and deals with the social implications of such a society.

rental: free

The Energy Carol

11 min. col. NFB 106c 0175 746

A humorous animation based on Dickens' A Christmas Carol, in which Scrooge, an energy waster, takes a tour of the world of the future and resolves to change. Good for younger groups.

Energy Management for the Future

24 min. col. NFB 106c 0176 525

Demonstrates that alternatives to our present energy habits do exist, and offers a variety of ideas and information on the subject. Through animation and humour, offers a warning without appearing pessimistic. Produced as an introduction for school groups, but useful for any audience as an introduction to the current energy situation.

Limits to Growth

30 min. col.

Bruce Raymond Limited

Defines the relationship between our current patterns of energy consumption, population growth, and resource depletion, with the underlying theme that society as a whole cannot continue to grow exponentially on a finite planet.

(not for rent) purchase price: \$595

Thoughts on the Future with George McRobie

29 min. col. NFB 106c 0174 118

A number of environmental specialists (from universities, government, and industry) discuss changes they foresee in the treatment of the earth's resources. Waste recovery and renewable energy sources are among the topics covered.

To Grow or Not to Grow - That is the Crisis

30 min. col. BPN 104101

videotape

Ontario Educational Communications Authority

Explains the Club of Rome prediction of global catastrophe by the year 2000, and shows why growth must be curbed if our civilization is to survive.

(Write for pricing structure: P.O. Box 200, Station Q, Toronto, Ont. M4T 2T1.)

What on Earth are We Doing?

12 min. col. NFB 106c 0175 608

A startling examination of the rate at which Canadians are using the earth's resources, and a look at why some people feel the urgent need to build a society based on "better" rather than on "more".

The Economies of Scale

Death of a Delta

30 min.

Marvin Melnyk Associates Ltd.

Describes the impact of the large-scale B.C. hydro development on the inhabitants of areas in that province and in Alberta.

rental: free from the Department of Energy, Mines and Resources.

Mac's Mill

12 min. col. NFB 106c 0176 298

Looks at an example of small-scale technology: a water-powered sawmill more than adequate to meet the needs of its owner, which can be duplicated many times over without harming nature's balance. While the example itself may not be relevant to everybody, the issues it raises deserve a wide airing.

The Other Way

49 min. col.

BBC Film Sales

Describes the ideas of the late E.F. Schumacher, and shows some applications of his Intermediate Technology Development Group in small industries.

rental: \$50 per day

Small is Beautiful - Impressions of Fritz

Schumacher

30 min. col. NFB 106c 0178 227

Shows the late philosopher shortly before his death, discussing some of the things that most concerned him: the passivity and rootlessness of modern man, and the necessity for appropriately-scaled technological and economic systems.

Toast

15 min. col.

EMR

Wordlessly traces the energy input into a single slice of toast. Illustrates the energy dependency of our society and the impact of each individual's consumption.

rental: free

Architecture and Home Energy

Design Innovations in Canadian Settlements

18 min. col.

Vision Habitat

Shows how modern human settlement design can best use valuable land and energy throughout the various regions of Canada.

rental: \$5

Bill Loosely's Heat Pump
10 min. col. NFB 106c 0175 068

Illustrates an alternative to home heating with fossil fuels. Shows a system that has been heating a house in Burlington, Ont. for almost 30 years, providing six times the heat energy required, for about \$75.00 per year.

Conservation Conversation
17 min. col.
(available from NFB and EMR)

Shows people from all over Canada talking about what conservation means to them. They tell ways they have found for conserving energy, and offer practical suggestions for the viewer.

Energy Conservation Through Home Insulation
EMR slide show

Details the importance of insulation and presents a complete guide to insulating one's own home.

rental: free

The Hottest Show on Earth
28 min. col. NFB 106c 0177 655

A hilarious treatment of home insulation, combining animation and live action. Dr. David Suzuki also talks about home heat loss, furnace maintenance, and the origins of fossil fuels.

The Insulation Story
24 min. col. NFB 106c 0177 671

A practical film showing how to evaluate the existing insulation in a residence, and describing how the home owner can retrofit his home at reasonable cost.

This is an Emergency
27 min. col. NFB 106c 0179 750

Host David Suzuki, takes an engaging look at our current energy problem, especially as it relates to oil. There is a special focus on the role of Canadian industry in becoming more energy efficient and a comparison with Swedish conservation efforts.

Transportation

A Bus - For Us
15 min. col. NFB 106c 0172 093

Shows how one suburban community organized its own public transportation after municipal authorities refused to extend city bus service into their area.

Where do We Go from Here?
22 min. col. NFB 106c 0173 081

Touches on many of the political and economic tensions underlying urban transportation systems.

Bate's Car - Sweet as a Nut
16 min. col. NFB 106c 0174 017

A delightful film encounter with a man who found his own substitute for gasoline in barnyard manure. Shows how a home-made digester turns manure into methane gas to power an auto.

Renewables

Blowhard
10 min. col. NFB 106c 0178 075

An animated parable on energy development, illustrating one fictitious company's switch to renewable resources at a time when conventional sources are dwindling. Appropriate for the young and the uninitiated.

Challenge of Change
17 min. 134 slide show
EMR

An introduction to renewable energy in Canada: solar, biomass, hydro, tidal and wind power are discussed with emphasis on specific projects being conducted across Canada. Appropriate for students and the uninitiated.

rental: free

An Introduction to Passive Design
20 colour slides and script
Canadian Renewable Energy Foundation

Explains the principles of passive solar house design.

purchase: \$35
rental: \$10/wk

An Introduction to Solar Greenhouses
20 slides and script
Canadian Renewable Energy Foundation

Explains what makes a solar greenhouse different from a traditional one.

purchase: \$35
rental: \$10/wk

Kitsilano Solar House
20 min. col.
Canadian Filmmakers Distribution Centre

Describes the construction and use of a townhouse co-op in Kitsilano, B.C., which uses three forms of solar collection.

rental: \$30

Renewable Sources of Energy
EMR slide show

Depicts a number of forms of renewable energy and shows their applicability in Canada.

rental: free

Solar Energy: Towards the Sun
28 min. col. NFB 106c 0178 484

Shows a number of experiments being carried out in Canada and the United States to tap the sun's energy.

The Solar Frontier
26 min. col. NFB 106c 0178 085

A documentary on the merits of residential solar heating in the snow belt. Introduces us to the architects of Canadian houses in which as much as 70% of the energy is derived from solar collectors, and explains the technology.

Sun, Wind and Wood
25 min. col. NFB 106c 0178 031

Several examples from Prince Edward Island illustrate some of the ingenious ways of using renewable sources of energy to combat fossil fuel shortages, thereby reducing reliance on nonrenewable fuels.

Tree Power
28 min. col. NFB 106c 0179 744

In a period of rapidly rising prices of conventional fuels, we are shown the advantages and disadvantages of wood heat as an alternative.

Warm and Safe
14 min. col. 16mm film or 3/4" video cassette
Insurance Bureau of Canada

Deals with the importance of safe installation, use, and maintenance of wood heating systems. Includes interviews and practical demonstration.

purchase price: \$100
rental: free

Recycling

One Man's Garden
21 min. col. NFB 106c 0174 057

A mixture of documentary and dramatic effect on the subject of garbage in general and, in particular, the part it plays in the life of one young man. He discards things all his life, until the day his own rejection by the lady he loves sets off a meditation on waste.

Energy Consumption and Garbage Reduction
EMR slide show

A detailed outline of how reducing garbage output works to save energy.

rental: free

An Introduction to Composting
20 colour slides and script
Canadian Renewable Energy Foundation

Introduces the basics of aerobic composting of kitchen and garbage wastes.

purchase price: \$35
rental: \$10/wk

Canwell - A Canadian Waste Management System
28 min. col. NFB 106c 0178 021

Describes a system which, instead of disposing of waste, converts and recycles it (after cleansing by water and soil) into usable products.

The Garbage Ouroboros
28 min. col. NFB 106c 1075 209

Shows some of the ways that have been developed for coping with waste. Introduces the increasingly sophisticated waste recycling and reprocessing industry.

A Matter of Common Sense
14 min. col.
Modern Talking Picture Service

Presents one family's way of controlling and recycling household waste. A concrete example of the relationship between home conservation and broader environmental issues.

rental: free

Next Time Around
17 min. col.
Dept. of Environment or Is-Five Foundation

Describes the many useful products which can be made from household garbage (especially newspaper) and shows some of the recycling projects that have been undertaken in Alberta.

rental: free

A Sense of Humus
28 min. col. NFB 106c 0176 067

Examines the methods of a number of organic farmers across Canada and discusses their results. Shows how food is being produced commercially without chemical fertilizers or pesticides.

Where to order films and slide shows

NFB offices in Canada

British Columbia Regional Offices:

1161 West Georgia Street
Vancouver, B.C. V6E 3G4
Telephone: (604)666-1716

545 Quebec Street
Prince George, B.C. V2L 1W6
Telephone: (604)564-5657

811 Wharf Street
Victoria, B.C. V8W 1T2
Telephone: (604)388-3868

Prairie Region Regional Offices:

674 St. James Street
Winnipeg, Manitoba R3G 3J5
Telephones: (204)985-4129 (office);
(204)985-4131 (film library)

344-12th Avenue S.W.
Calgary, Alberta T2R 0H2
Telephones: (403)231-5332 (office);
(403)231-5414 (film library)

Centennial Building
10031-103rd Avenue
Edmonton, Alberta T5J 0G9
Telephone: (403)425-7540

2nd Floor
1917 Broad Street
Regina, Saskatchewan S4P 1Y1
Telephones: (306)569-5014 (office);
(306)569-5012 (film library)

Ontario Regional Offices:

Mackenzie Building
1 Lombard Street
Toronto, Ontario M5C 1J6
Telephone: (416)369-4245

First Place Hamilton
10 West Avenue South
Hamilton, Ontario L8N 3Y8
Telephones: (416)523-2347/8

New Federal Building
Clarence Street
Kingston, Ontario K7L 1X0
Telephone: (613)546-6748

Suite 205
659 King Street East
Kitchener, Ontario N2G 2M4
Telephone: (519)743-4661

366 Oxford Street East
London, Ontario N6A 1U7
Telephone: (519)679-4120

195 First Avenue West
North Bay, Ontario P1B 3B8
Telephone: (705)472-4740

910 Victoria Avenue
Thunder Bay, Ontario P7C 1B4
Telephone: (807)623-5224

National Capital Region Regional Office:

Suite 642
150 Kent Street
Ottawa, Ontario K1A 0M9
Telephones: (613)996-4861/2

Quebec Regional Offices:

550 Sherbrooke Street West
Montreal, Quebec H3A 1B9
Telephones: (514)283-4753/4 (office);
(514)283-4823/4 (representatives);
(514)283-4685 (film library)

72 Cartier Street West
Chicoutimi, Quebec G7J 1G2
Telephone: (418)543-0711

2, Place Quebec
Boulevard St-Cyrville Est
Quebec, Quebec G1R 2B5
Telephones: (418)694-3176/694-3852

124 Vimy Street
Rimouski, Quebec G5L 3J6
Telephone: (418)723-2613

315 King Street West
Sherbrooke, Quebec J1H 1R2
Telephones: (819)565-4915 (office);
(819)565-4931 (film library)

Room 502, Pollack Building
140 St. Antoine Street
Trois-Rivieres, Quebec G9A 5N6
Telephones: (819)375-5714 (office);
(819)375-5811 (film library)

Atlantic Region Regional Offices:

1572 Barrington Street
Halifax, Nova Scotia B3J 1Z6
Telephone: (902)426-6000

Sydney Shopping Mall
Prince Street
Sydney, Nova Scotia B1P 5K8
Telephone: (902)562-1171

Terminal Plaza Building
1222 Main Street
Moncton, New Brunswick E1C 1H6
Telephones: (506)858-2463/4 (distribution)

1 Market Square
Saint John, New Brunswick E2L 1E7
Telephone: (506)658-4994

202 Richmond Street
Charlottetown, P.E.I. C1A 1J2
Telephone: (902)892-6612

Building 255
Pleasantville
St. John's, Newfoundland A1A 1N3
Telephone: (709)737-5005

4 Herald Avenue
Corner Brook, Newfoundland A2W 6C3
Telephone: (709)634-4295

Other film distributors

BBC Film Sales
Manulife Centre, Suite 510
55 Bloor Street West
Toronto, Ontario M4W 1A5
Telephone: (416)925-3891

Canadian Renewable Energy Foundation
Box 4902, Station "E"
Ottawa, Ontario K1S 5J1
Telephone: (613)235-3758
Note: Slide shows from this source are
sent in boxes. Groups must provide
trays.

(EMR) Department of Energy, Mines and
Resources
Conservation and Renewable Energy Branch
6th Floor, 580 Booth Street
Ottawa, Ontario K1A 0E4
Telephone: (613)995-1801
Note: Slides from this source are sent in
boxes. Groups must provide trays.

Insurance Bureau of Canada
170 University Avenue
Toronto, Ontario M5H 3B3
Telephone: (416)362-2031
Offices also in Montreal, Halifax,
Vancouver, and Edmonton.

Is-Five Foundation
477 Dupont
Toronto, Ontario M6G 1Y6
Telephone: (416)531-3548

Modern Talking Picture Service
143 Sparks Avenue
Willowdale, Ontario M2H 2S5
Telephone: (416)498-7293

1055 Beaver Hall Hill
Montreal, Quebec H2Z 1S5
Telephone: (514)878-3644

1572 West Fourth Avenue
Vancouver, B.C. V6J 1L7
Telephone: (604)736-8331

Ontario Educational Communications
Authority
P.O. Box 200, Station "Q"
Toronto, Ontario M4T 2T1
Telephone: (416)484-2613

Bruce Raymond Limited
63 Huntley Street
Toronto, Ontario M4Y 2L2
Telephone: (416)923-9654

SPEC - The Canadian Scientific Pollution
and Environmental Control Society
1603 W. 4th Ave.
Vancouver, B.C. V6J 1L8
Telephone: (604)879-6806

Vision Habitat
2206 E. Mall, 4th Floor
Library Processing Centre
Vancouver, B.C. V6T 1W5
Telephone: (604)228-4415

